

P013 Sumoylation and dimerization in muskelin – possible role in protein function.

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Muskelin is a 85 kDa multidomain intracellular protein involved in cytoskeletal organization and probably in neuronal migration. The analysis of its sequence reveals a discoidin domain within the muskelin N-terminal region and a β -propeller created by six repeated kelch motifs in the C-terminal part of the protein. The central region of muskelin, predicted to have α -helical secondary structure, contains LisH and CTLH domains. Our goal was to determine the biological function of muskelin by investigating its individual domains, concentrating on discoidin and LisH-CTLH motifs. So far, the LisH-CTLH motif has been identified in neuronal migration and nuclear transport proteins. Muskelin is known to interact with other proteins containing this motif, such as nuclear protein RanBPM. We postulate that muskelin can be transported into the nucleus to interact with nuclear proteins with help of the sumoylation mechanism. It has 11 predicted sumoylation sites and we showed that at least 2 of them are sumoylated *in vitro*. We are going to establish the sites of sumoylation *in vitro* and *in vivo* (in adult rat brain, where we already showed muskelin expression) and try to determine the function of this modification. Our study will also encompass muskelin structure solution and the research on its cellular function. We had shown that muskelin exist as dimer and monomer *in vitro*, but in adult brain as dimer in the majority. We found that muskelin is colocalized in neuronal cells in synapses. In some cellular conditions, muskelin binds to the membrane. We revealed that discoidin domain bind phospholipid derivatives.